

## **ABSTRACT OF THE DISCLOSURE**

Optical interconnect layers and methods of fabrication thereof are described. In addition, the optical interconnect layers integrated into devices such as backplane (BP), printed wiring board (PWB), and multi-chip module (MCM) level devices are  
5 described. A representative optical interconnect layer includes a first cladding layer, a second cladding layer, one or more waveguides having a waveguide core and an air-gap cladding layer engaging a portion of waveguide core, wherein the first cladding layer and the second cladding layer engage the waveguide.